Next Gen Challenge of CNG Program in Dhaka

Presented by
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at
Workshop on Air Quality and Sustainable Transportation Challenge in South Asian Cities
organized by
Centre for Science and Environment (CSE), Delhi
Bangladesh Road Transport Authority and
Work for a Better Bangladesh Trust, Dhaka
at
University of Dhaka, Dhaka
On 30 April 2013
## Fuel used in Transport Sector of Bangladesh

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Widely used</th>
<th>(Lead), Sulfur</th>
<th>PM, VOC, lead, Nox, SO2, GHG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrol</td>
<td>Widely used</td>
<td>(Lead), Sulfur</td>
<td>PM, VOC, lead, Nox, SO2, GHG</td>
</tr>
<tr>
<td>Diesel</td>
<td>Widely used</td>
<td>Sulfur</td>
<td></td>
</tr>
<tr>
<td>CNG</td>
<td>used</td>
<td>-</td>
<td>GHG (small)</td>
</tr>
<tr>
<td>LPG</td>
<td>very small</td>
<td>-</td>
<td>GHG (small)</td>
</tr>
<tr>
<td>Electricity</td>
<td>Becoming popular</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Traffic contribution to Air Pollution

Air pollution: PM, CO, Nox, SO2, VOC
- Air pollution causes serious threat to public health
- (10 -15 thousand pre-matured deaths per year)
- Plant quality and growth affected
- Corroded building materials
- Ecosystem disturbed

• Case study on Dhaka (2002)
  - Nox emission: 31,903 tons; SO2 emissions: 19,396 tons (2000)
  - Cost of air pollution: US$10 m per year (2-stroke auto rickshaw)
  - Total cost in Dhaka: US$ 250 m per year

• Worsening factors for Bangladesh, especially Dhaka
  - Population growth
  - Rapid urbanization
### Air quality at Farmgate area (2000, DOE)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SPM [micro-gm/m³]</td>
<td>2081.40</td>
<td>1659.6</td>
<td>2485.26</td>
<td>2300.35</td>
</tr>
<tr>
<td>NOx [micro-gm/m³]</td>
<td>27.17</td>
<td>41</td>
<td>66.5</td>
<td>58.1</td>
</tr>
<tr>
<td>SO₂ [micro-gm/m³]</td>
<td>15</td>
<td>66</td>
<td>146.19</td>
<td>121.3</td>
</tr>
</tbody>
</table>
Policy Responses by Govt of Bangladesh

- 1 July 1999: no lead in gasoline
- 1 January 2003: Ban on 2 stroke engines
- Introduction of CNG
Advantages of CNG as transport fuel

- Very low particulate matter
- Low emission of airborne toxins
- (No) sulfur dioxide emission
- Less noisy operation with less vibration and less odors
History of CNG in Bangladesh

- 1982-1985 Petrobangla undertook techno-financial study on CNG as alternative fuel to petrol / diesel
- After successful piloting, CNG Co Ltd was established in 1987 which became Rupantarita Prakritik Gas Company Limited (RPGCL) in 1991
- Additional benefits: save foreign currency, reduction of air pollution
- Main functions of RPGCL:
  - Popularization of CNG as a transport fuel
  - Establishment of CNG infra-structure (First conversion workshop and first CNG refueling station were established)
  - Multiple use of natural gas
  - Natural gas liquid
CNG Policies adopted by the Government

- Awareness building on CNG use among stakeholders
- Infra-structure: Permission for CNG conversion workshops and refueling stations in the private sector
- Allocation of govt. land to private sector entities for CNG conversion workshops and refueling stations at very concessional rates
- Special tax concessions for import of CNG vehicles
- Loan and tax free import of parts for conversion of diesel / petrol vehicles into CNG vehicles
- Counseling of private sector investors
- Training of staffs in CNG workshops and refueling workshops
- Standardization and quality control: Regulatory body RPGCL
- Conversion of government vehicles
Some Projects

- 1982 -1983: Alternative Fuel to petrol / diesel
- 1986 -1996 (delayed): CNG project (4 CNG filling stations, conversion of 750 petrol and 250 diesel engines in and around Dhaka)
- 2003-2006: Dhaka clean fuel project (filling stations and workshops in and around Dhaka, Dhaka-Chittagong highway)
Cost of CNG

• Feed gas for filling station: 23 Tk/m3
• Sales price at filling station: 30 TK/m3
• (Price is low, fuel expenses are around 40% compared to octane expenses.)
CNG Activities

- CNG and CNG price policies led to a boom of CNG filling stations and vehicles.

- Many say: the rise in vehicle number is attributed to low CNG price

<table>
<thead>
<tr>
<th>Year</th>
<th>Filling stations</th>
<th>Workshops</th>
<th>Converted vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>Start</td>
<td>Start</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>7</td>
<td>1</td>
<td>1,379</td>
</tr>
<tr>
<td>2003</td>
<td>11</td>
<td>7</td>
<td>2,800</td>
</tr>
<tr>
<td>2006</td>
<td>105</td>
<td>72</td>
<td>42,084</td>
</tr>
<tr>
<td>2009</td>
<td>340</td>
<td>58</td>
<td>73,145</td>
</tr>
<tr>
<td>2011</td>
<td>124</td>
<td>43</td>
<td>36,356</td>
</tr>
</tbody>
</table>
## CNG Activities at a glance: September 2012

<table>
<thead>
<tr>
<th>Subject</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CNG vehicles</td>
<td>207,177</td>
</tr>
<tr>
<td>Converted</td>
<td>1,79,089</td>
</tr>
<tr>
<td>Imported</td>
<td>28,088</td>
</tr>
<tr>
<td>CNG conversion workshops</td>
<td>180</td>
</tr>
<tr>
<td>CNG filling stations</td>
<td>555</td>
</tr>
</tbody>
</table>
Saving of foreign currency

- CNG use: 100 MMCM per month - 5% of total gas consumption
- Foreign currency saving: Taka10,200 crore per year
Impact of CNG in transport sector

• Saving of foreign currency
• Significant reduction of emission (average speed: 25 km/h, in peak hour: 5 km/h) although it is still high
• Both foreign currency expenditure & emission would have been much higher
• Health costs due to emission would have been much higher
Recent Discussions

• Shortage of gas supply has led to rationing (between 5 – 9 pm, no CNG supply)

• Question: should CNG be used as transport fuel as it is now?
• Before taking decisions:
  • If foreign currency saving is not that much important,
    - What is about environmental aspects?
    - Can Dhaka and its residents cope with the emissions that would be emitted from increasing number of engines?
    - Can catalysts be introduced to all vehicles? What would be the costs?
    - What would be the life quality at Dhaka?
    - What would be the health costs?

• The answer is very clear: Dhaka needs CNG.
• But how?
  - The price is definitely low. It should be fixed after taking all fuel, environmental, health and social aspects into consideration.